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Division of Wildlife Conservation
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Northern Goshawk Monitoring, Population Ecology and Diet
on the Tongass National Forest
1 October 1999–30 September 2000

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**Annual Research Performance Report
Endangered Species Conservation Fund
Federal Aid Study SE-4-2-5**

This is a progress report on continuing research. Information may be refined at a later date.

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FEDERAL AID ANNUAL RESEARCH PERFORMANCE REPORT

PROJECT TITLE: Northern Goshawk Monitoring, Population Ecology and Diet on the Tongass National Forest

AUTHOR: Kimberly Titus and Stephen B. Lewis

COOPERATORS: US Forest Service and US Fish and Wildlife Service

GRANT AND SEGMENT NR.: SE-4-2-5

SEGMENT PERIOD: 1 October 1999 – 30 September 2000

STATE: Alaska

WORK LOCATION: Douglas and Ketchikan

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE 1: Monitoring of northern goshawk nesting areas in cooperation with USDA Forest Service.

Goshawks are an important monitoring component associated with the 1997 revision of the Tongass Land and Resource Management Plan for the FS. The FS has instituted an interagency goshawk-monitoring plan associated with their requirement to protect and conserve habitats for goshawks to ensure that they remain viable and well distributed on the Tongass National Forest. Resource agencies are also interested in conserving and managing for goshawks so that there is no need to list the species under the Endangered Species Act (ESA). This project is the primary data-gathering component of a multi-agency effort devoted to long-term monitoring of goshawk nesting areas and determination of goshawk movements based on radiotelemetry data. After the 1999 field season, it was decided that ongoing field efforts by ADF&G staff would be downgraded to a supportive role that entailed assisting the FS in nest monitoring efforts.

OBJECTIVE 2: Reanalysis of goshawk radiotelemetry data and update of vegetation mapping and GIS data layers.

Patterns of goshawk movements, habitat use, and habitat selection based on radiotelemetry were analyzed previously using data collected from 1992 to 1995 (Iverson et al. 1996). Since these analyses, additional telemetry locations have been acquired that will allow a more thorough analysis of movement patterns and home range. Based on these home range data, an analysis of the types of vegetation used by

goshawks is pertinent. This analysis is dependent on Forest Service GIS coverages and vegetation data.

OBJECTIVE 3: Description of breeding season diet of goshawks.

The second and final field season of a goshawk diet study by Boise State University M.S. student Steve Lewis was completed during 1999. ADF&G, FS and FWS jointly funded this study; Lewis used small, remote cameras and video recorders to identify prey brought to goshawk nests. From these data, we will determine the types of goshawk prey species that are associated with old-growth coniferous forests in Southeast Alaska. During the winter of 1999/2000, analyses of these data were to take place to provide a quantitative description of goshawk diet.

OBJECTIVE 4: Preparation of reports for publication.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Searching for active goshawk nests and capturing goshawks.

This objective was partially met because fewer nest areas were visited than in previous years in accordance with ADF&G's decision to allow FS staff to take the lead on monitoring efforts.

Ten active goshawk nests were identified on the Tongass in 2000 (Tables 1-3). Nine occurred within previously documented nesting areas and 1 occurred within a new nesting area (Shady, Wrangell Island) located this year. At several locations (Eagle River, MacDonald Lake, Turner Lake), goshawks were seen during the breeding season but an active nest was never found. With the discovery of 1 new nesting area in 2000, the cumulative number of nesting areas documented in Southeast Alaska increased to 62.

During 2000, ADF&G personnel captured 3 goshawks (2 adults, 1 juvenile) at 2 nest sites in Southeast Alaska. We attached a tail-mounted transmitter to 1 adult goshawk captured for the first time. In addition, 2 goshawks (1 adult, 1 juvenile) were instrumented with satellite transmitters (PTTs) during 2000. An adult female from Heceta Island (Timber Knob nesting area) and a juvenile female from Douglas Island (Blueberry Hill nesting area) were tagged with PTTs. This was performed as a pilot study to determine whether PTTs could be used in the rugged topography and dense forests of Southeast Alaska. Through February 2001 we obtained 170 and 55 locations (Argos location classes, 3,2,1; high, medium and low quality) from the Timber Knob and Blueberry Hill birds, respectively. We determined that satellite tracking provided a more cost effective approach to acquiring goshawk location information than traditional aerial radiotelemetry. There are significant tradeoffs however. Satellite locations data has built-in accuracy error factors, there is no visual estimation of habitat associations as acquired by an observer in an aircraft, and the technology does not allow ground relocation of the signal, such as to find a nest or dead bird.

JOB 2: Analysis of radiotelemetry data to assess goshawk movements, followed by an analysis of vegetation use and selection using a geographic information system (GIS).

The first portion of this objective was met, as there was a re-analysis of the radiotelemetry data including all locations acquired through 1999. We had a reduced aerial tracking effort during 2000 because of reduced funding. We also experienced a higher rate of radiotransmitter failure during this period. As a result, little additional data were collected. Summaries of home range estimates are provided in another report (Flatten et al. 2001).

A number of types of home ranges were summarized in GIS (e.g., 100% MCP, 90% convex polygon, various pooling of sexes and nesting areas). These spatial data were transferred to the FS but an updated vegetation map of the Tongass has not been completed. ADF&G staff members are unable to complete the vegetation analysis without this updated map.

JOB 3: Analysis of prey delivery, prey remains, and pellet data to quantitatively describe the diet of goshawks in Southeast Alaska and examine variation in the diet throughout the area. This objective was partially completed but the amount of information to be analyzed was greater than anticipated and additional analyses were warranted.

M.S. student Steve Lewis documented >1540 prey deliveries, and collected 285 bags of prey remains and 146 bags of pellets during the 1998 and 1999 field seasons. During the winter of 1999/2000, he reviewed all videotapes and began analysis of these data and the identification and analysis of prey remains and pellet data gathered throughout Southeast Alaska by ADF&G and FS personnel. In general, goshawks in Southeast Alaska eat similar prey to those goshawks nesting in other parts of their range. Goshawks preyed on birds more often than mammals in Southeast Alaska.

JOB 4: Analysis of data and preparation of reports for publication.

ADF&G personnel began analysis of data collected since the beginning of this interagency project in 1991. Emphasis was placed on determining home ranges, habitat associations, and inter-year movements using radiotelemetry data. In addition, an analysis of the subspecific status of goshawk in Southeast Alaska was initiated, based on morphological data gathered since 1991. Nothing was submitted for publication pending completion of analyses.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

Resource agencies are interested in conserving and managing for goshawks so that there is no need to list the species under the Endangered Species Act (ESA). Because of forest management and ESA issues, the US Fish and Wildlife Service (FWS) has needed information about the Queen Charlotte goshawk (*A. g. laingi*) as related to ongoing litigation

about the status of the subspecies related to an ESA petition. During the fall of 1999, FWS was required by court order to generate an estimate of the size of the population of goshawks that are within Southeast Alaska. The FWS requested the assistance of ADF&G staff in helping meet their legal requirements. ADF&G staff spent significant time during the winter of 1999/2000 contributing to this population estimate. Tasks included the scheduling, facilitating, and leading an interagency workshop to estimate goshawk population size using habitat and home range size modeling methods. At the interagency workshop we reviewed a number of possible approaches including combining home range size estimates and habitat types as a habitat capability approach. Biologists were uncomfortable with all approaches because of numerous untested assumptions involved in making these extrapolations. Our final interagency approach estimated a maximum habitat capability of up to 747 nesting pairs of goshawks on the Tongass National Forest. These results were not amenable to the calculation of confidence intervals.

IV. RECOMMENDATIONS FOR THIS PROJECT

The tenth field season of this cooperative study was completed in 2000. After discussions with FS staff, objectives of the ADF&G staff were altered after the 1999 field season to take a secondary role to FS personnel for monitoring goshawk nests. During this period we recommended that the FS begin considering how they would conduct goshawk monitoring efforts as ADF&G staff devoted less time to fieldwork and interagency coordination and more time to data analysis and report preparation. Several discussions among division staff and between division and FS staff were held to discuss other data needs for this project, to shape the future of this project, and to direct ADF&G's role in the research.

V. PUBLICATIONS

None

VI. FEDERAL AID TOTAL PROJECT COSTS FOR THIS SEGMENT PERIOD

\$ 22,500

VII. PREPARED BY:

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APPROVAL DATE: _____

Table 1. Activity status of known northern goshawk nest areas in the Ketchikan Area of the Tongass National Forest in Southeast Alaska, 1998-2000; codes defined beneath table.

Nest Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Butterball Lake, Heceta Island				O	N A R	O	O	O	O	O
Carroll River, Revilla.Island						G	N A	G	G	O
Convenient Cove, Hassler Island		G	G	N A	G	G	O	O	O	O
Derrumba Ridge, Heceta Island							N O	O	O	O
Logjam Creek, P.O.W. Island			N A R	O	O	O	O	O	O	O
Margaret Lake, Revilla.Island				N A	G	B R	B R	B R	O	O
McDonald Lake, Cleveland Peninsula									N A	G
Port Refugio, Suemez Island	O	G	G	B	G	G	O	O	O	O
Rio Roberts/Cutthroat Creek, P.O.W. Island					N A R	B R	B R	B R	O	O
Sarheen Creek, P.O.W. Island	G F	G	G	O	O	O	O	O	O	O
Sarkar Lake, P.O.W. Island		N A R	O	O	G	O	O	O	O	O
Timber Knob, Heceta Island						N A	B	C(96) R	B R	C(97)
Traitors Creek, Revilla.Island				N A R	B R	O	O	O	O	O
Twelvemile Arm, P.O.W. Island						N O	O	O	O	X

A = active nest first located.

C = previously known active nest reused; () = year first active.

G = goshawk(s)/activity observed during breeding season, active nest not located.

O = no goshawk/activity observed, active nest not located.

X = area not checked.

B = active alternate nest located.

F = fledgling(s) observed, active nest not located.

N = nest area documented this year.

R = adult(s) radiotagged and/or present.

Table 2. Activity status of known northern goshawk nest areas in the Stikine Area of the Tongass National Forest in Southeast Alaska, 1998-2000; codes defined beneath table.

Nest Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Big John Creek, Kupreanof Island		N A	B R	O	O	O	O	O	O	O
Brown Cove, Petersburg Mainland								N A	B R	O
Camp Carl, Etolin Island							N A R	B R	B R	C(99)
Cat Creek, Cape Fanshaw Mainland				N A R	O	O	X	O	O	O
Doughnut, Wrangell Island									N A R	B
Duncan Creek, Kupreanof Island				N A	O	O	G	O	B R	B R
East Bay of Pillars, Kuiu Island				N A R	B R	X	B R	O	O	O
Elena Bay, Kuiu Island								N A R	B R	B
Farragut Bay, Petersburg Mainland									N A R	B
Irish Lakes, Kupreanof Island						N A	G	O	O	O
Kadake Bay, Kuiu Island						N A R	O	O	O	O
Kake, Kupreanof Island (cut in 1989)	X	X	X	X	X	X	X	X	X	X
Kuakan, Deer Island							N A	B	B R	O
Madan Bay, Wrangell Mainland								N G F	B R	C(99)
Mitchell Creek, Kupreanof Island				N A R	B	O	O	O	O	O
Mossman Inlet, Etolin Island	X	O	O	X	X	X	X	X	O	X
Mountain Point, Kupreanof Island				N A R	O	X	O	O	O	O
Negro Creek, Port Houghton Mainland				N A	G	O	O	O	O	X
Rowan Creek, Kuiu Island			N A R	R T	G	O	G	O	O	X
Sanborn Canal, Port Houghton Mainland				N A	O	O	X	G	O	X
Security Bay, Kuiu Island							N A R	O	O	X
Shady, Wrangell Island										N A
Starfish, Etolin Island	N A	O	O	O	O	X	O	O	B R	O
Totem Camp, Kupreanof Island				N A	O	X	O	O	O	X
Tunehean Creek, Kupreanof Island								N A	B R	O
Upper Totem, Kupreanof Island			N O	O	O	X	G	O	O	O
West Bay of Pillars, Kuiu Island				N A R	B R	X	O	O	O	O
Zim Creek, Kupreanof Island									N A	X

A = active nest first located.

C = previously known active nest reused; () = year first active.

G = goshawk(s)/activity observed during breeding season, active nest not located.

O = no goshawk/activity observed, active nest not located.

T = radiotagged adult present but did not nest.

B = active alternate nest located.

F = fledgling(s) observed, active nest not located.

N = nest area documented this year.

R = adult(s) radiotagged and/or present.

X = area not checked.

Table 3. Activity status of known northern goshawk nest areas in the Chatam Area of the Tongass National Forest in Southeast Alaska, 1998-2000; codes defined beneath table.

Nest Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Auke Bay, Juneau Mainland								N A R	O	O
Blueberry Hill, Douglas Island			N A R	B R	C(93) R	R T	C(94) R	B R	B R	C(94)
Dewey Lake, Skagway Mainland	X	X	X	X	X	X	X	X	X	X
Distin Lake Trail, Admiralty Island				N A	X	X	B	O	B	O
Duffield Peninsula, Baranof Island				N A	C(94)	C(94)	O	X	B	O
Eagle Creek, Douglas Island			N A R	R T	O	O	O	O	O	O
Eagle River, Juneau Mainland							N G F	A R	B R	G
Fish Creek, Douglas Island				N A R	B R	B R	B R	C(96) R	B R	O
Florence Bay, Chichagof Island						N A R	O	O	O	O
Green Cove, Admiralty Island						N A R	B R	B R	C(96) R	B
Lace River, Berners Bay Mainland				N A R	R T	O	O	O	X	O
Mud Bay River, Chichagof Island			N A	G F	O	X	O	C(93)	O	O
Nugget Creek, Juneau Mainland			N A R	B R	R T	O	C(93) R	C(94) R	O	O
Pavlof River, Chichagof Island					N A R	R T	R T	O	O	O
Point Bridget, Juneau Mainland		N A	B R	O	G	G	G	B R	B	O
Ready Bullion Creek, Douglas Island	N A	B R	O	O	O	O	C(91) R	B R	C(92) R	O
Sitkoh River, Chichagof Island									N A	O
Tolch Rock, Juneau Mainland									N A R	O
Turner Lake, Juneau Mainland						N G F	A	G	G F	G F
Whitestone, Chichagof Island					N G F R	A R	O	O	O	X

A = active nest first located.

C = previously known active nest reused; () = year first active.

G = goshawk(s)/activity observed during breeding season, active nest not located.

O = no goshawk/activity observed, active nest not located.

T = radiotagged adult present but did not nest.

B = active alternate nest located.

F = fledgling(s) observed, active nest not located.

N = nest area documented this year.

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